D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Summary of Cancer Incidence and Mortality for ZIP Code 29690 (Travelers Rest, SC)

South Carolina Central Cancer Registry
South Carolina Department of Health and Environmental Control

In order to determine if there are any unusual cancer patterns in an area the first step is to look at the number of new cancer cases (incidence) or deaths (mortality) occurring in the ZIP code and compare this to the number of cancer cases and deaths expected to occur by chance alone, given the corresponding South Carolina state rates (see Tables 1 & 2). The number of expected cases and deaths are determined by using South Carolina state cancer incidence and mortality rates and applying them to the population of the geographic area (29690). These observed and expected values allow for the calculation of a chi-square test statistic to look for statistically significant differences in incidence. Note that although some differences in incidence or mortality may be statistically significant, *they may still not meet all of the criteria to qualify as a significant cancer cluster*. When significant results are encountered, additional steps are taken to look at the data more closely (e.g., counts, type of cancers, age, etc.).

Cancer Incidence in ZIP Code 29690

Table 1 shows what types of cancer occurred in ZIP code 29690 from 2000-2004, and how many cancer cases were expected. Overall, there were more cases of cancer observed than expected. A total of 403 new cases of cancer occurred in the ZIP code, while 371 cases were expected. The most common types of cancer were prostate, female breast, lung/bronchus, and colon/rectum cancers. These four types of cancer are also the most common cancers occurring across all of South Carolina.

The analysis revealed four specific cancer types **(prostate, melanoma, leukemia, and oral/pharynx)** where the number of cases was significantly higher than expected. A total of 80 new prostate cancer cases occurred in ZIP code 29690 while 60 were expected. Prostate cancer is the most common cancer diagnosed in SC (2000-2004). The causes of prostate cancer are not well known, however, researchers have determined a few risk factors that increase a man's chance of developing this disease. These risk factors include increasing age, a diet high in fat, a lack of physical activity, and family history of the disease. Also, prostate cancer occurs almost 70% more often in African-Americans as it does in white American men (1,2). Age is one of the most well established risk factors for prostate cancer, with 65% of all diagnosed cases occurring in men over 65 years of age (1). For ZIP code 29690, 83% of the prostate cancer cases diagnosed from 2000-2004 occurred in men over 60 years of age.

A total of 26 new melanoma cancer cases occurred in ZIP code 29690 while 15 were expected. Greenville county, where the city of Travelers Rest, SC, is located, has the highest melanoma cancer incidence rate (26.2 per 100,000), for this 5 year period (2000-2004), than any county in SC. The main risk factor for melanoma is excessive exposure to ultraviolet radiation from sunlight or tanning booths. Also, having certain types of moles makes a person more likely to develop melanoma. Finally, the risk of melanoma is greater if one or more of a person's first degree relatives have been diagnosed with melanoma (1,2).

A total of 21 new leukemia cancer cases occurred in ZIP code 29690 while 9 were expected. For the 5 year period (2000-2004) used in this analysis, Greenville county had the 2nd highest leukemia cancer incidence rate (14.7 per 100,000) in the state. There are four main types of leukemia, and each has a totally different set of risk factors associated with it. Chronic lymphocytic (CLL) and chronic myelocytic leukemias (CML) occur most often in adults. The only

known inherited risk factor for chronic leukemia is having first degree relatives who have had CLL. Long term contact with herbicides and pesticides among farmers can increase their risk of CLL (1,2).

Acute lymphocytic leukemia (ALL) occurs most often in children. Acute myelocytic leukemia (AML) occurs mostly in adults. Smoking is a proven risk factor for AML. About 1/5 of AML cases are caused by smoking. Also, scientists have discovered that people exposed to benzene or to large amounts of radiation (such as in people receiving treatment for other cancers) have an increased risk of ALL and AML (1,2).

A total of 16 new oral/pharyngeal cancer cases occurred in ZIP code 29690 while 10 were expected. Tobacco use is the main risk factor associated with oral/pharyngeal cancer. About 90% of people with oral/pharyngeal cancer use tobacco. The risk of developing these cancers increases with the amount smoked or chewed and the duration of the habit. Alcohol use also strongly increases a person's risk of developing oral/pharyngeal cancer. People who smoke and drink have a much higher risk of cancer than those using only alcohol or tobacco alone. Other risk factors for oral/pharyngeal cancer include vitamin A deficiency, exposure to ultraviolet light, and infection with the human papillomavirus (HPV) (1,2).

Cancer Deaths in ZIP Code 29690

To assess cancer deaths in this ZIP code, cancer mortality data from 2000-2004 were used. The same process used to analyze new cancer cases was also used to analyze cancer deaths. Table 2 shows the number of cancer deaths that occurred and the number expected in the ZIP code. A total of 145 cancer deaths occurred in this ZIP code, while 151 deaths were expected. Therefore, fewer cancer deaths occurred than expected. The analysis did not reveal a specific cancer type where the number of cancer deaths was significantly higher than expected.

Conclusions

To summarize, higher cancer cases occurred in ZIP code 29690 than expected, but not at a statistically significant level; and fewer cancer deaths were observed than expected. Prostate, melanoma, leukemia, and oral/pharyngeal cancer cases were significantly elevated. Although the observed number of cases for the aforementioned cancer types was significantly higher, the observed number of cancer cases was not found to be at least 3 to10 times over the expected number of cases. One of the criteria for determining a true cancer cluster is that there must be a 3-10 fold increase over the expected. This criterion is not fulfilled for any of the elevated cancers.

In order for a true cancer cluster to exist, the number of cancers occurring must be more than would be expected by chance. Along with statistical testing, there are several other criteria that determine whether a true cancer cluster exists. First, a cancer cluster would more likely involve rarer types of cancer rather than more common cancers like lung or prostate cancers. Also, a cancer cluster would occur with one specific type of cancer rather than having excesses in several different types of cancer. (See Cancer Assessment Investigation Guidelines for further information).

Taking all these criteria into consideration, the South Carolina Central Cancer Registry determined there is no evidence of cancer clustering in ZIP code 29690.

For questions about this report, please contact Susan Bolick-Aldrich at the SC Central Cancer Registry.

Report provided by:

SC Central Cancer Registry
Department of Health and Environmental Control
810 Dutch Square Blvd., Ste. 220
Columbia, SC 29210
Phone: (800) 817-4774 or (803) 731-1419

References:

1. American Cancer Society website, www.cancer.org
2. National Cancer Institute, www.cancer.gov

Information on cancer incidence provided by the SC Central Cancer Registry, Office of Public Health Statistics and Information Services, SC Dept. of Health and Environmental Control.

Information on cancer mortality provided by the Division of Vital Registry and the Division of Biostatistics & Health GIS, SC Dept. of Health and Environmental Control.

04/24/07cmm

Table 1. Analysis of Cancer Cases in ZIP Code 29690, 2000-2004

Cancer Type	Observed No. of Cases	Expected No. of Cases	Observed/ Expected	Chi-Square Test*	Significance
Prostate	**80**	**59.6**	**1.34**	**6.95**	**YES↑**
Female Breast	51	52.9	0.96	0.07	NO
Lung & Bronchus	51	57.4	0.89	0.72	NO
Colon & Rectum	30	41.2	0.73	3.03	NO
Melanoma of the Skin	**26**	**14.9**	**1.75**	**8.33**	**YES↑**
Other Unknown, Ill-defined	23	N/A	N/A	N/A	N/A
Leukemia	**21**	**9.0**	**2.33**	**15.99**	**YES↑**
Oral Cavity & Pharynx	**16**	**9.7**	**1.66**	**4.16**	**YES↑**
Kidney & Renal Pelvis	15	10.8	1.39	1.67	NO
Non-Hodgkin Lymphoma	13	13.3	0.98	0.01	NO
Pancreas	12	8.3	1.45	1.70	NO
Urinary Bladder	11	13.3	0.83	0.40	NO
Corpus and Uteri, NOS	8	8.3	0.97	0.01	NO
Brain & CNS	7	5.0	1.39	0.78	NO
Thyroid	6	5.2	1.16	0.13	NO
Ovary	6	5.6	1.08	0.04	NO
Stomach	4	5.5	0.72	0.43	NO
All Cancer Types	403	371.2	1.09	2.72	NO

Excludes in-situ cases of cancer, except bladder to allow for comparison.

Cancer Types with less than 5 cases of cancer expected are not analyzed due to the unreliability of statistical tests based on small numbers.

*** The Chi-square statistical test allows us to determine if the difference between what is observed and what is expected is significant.**

If the value is greater than 3.84, then we are 95% confident that the observed number of cases is significantly different from the expected number of cases.

↑: Indicates that the observed number of cases were significantly higher than the expected; based on a Chi-square value greater than 3.84.

Table 2. Analysis of Cancer Deaths in ZIP Code 29690, 2000-2004

Cause of Death	Observed No. of Deaths	Expected No. of Deaths	Observed/ Expected	Chi-Square Test*	Significance
Lung and Bronchus	46	46.0	1.00	0.00	NO
Female Breast	16	11.1	1.44	2.16	NO
Pancreas	13	8.0	1.63	3.20	NO
Miscellaneous Malignant Cancer	12	N/A	N/A	N/A	N/A
Colon and Rectum	9	14.4	0.63	2.02	NO
Leukemia	8	5.3	1.51	1.37	NO
Non-Hodgkin Lymphoma	6	5.0	1.21	0.21	NO
Prostate	5	7.8	0.64	0.99	NO
Brain and Other Nervous System	4	3.6	1.11	0.05	NO
All Malignant Cancers	145	150.8	0.96	0.22	NO

Cancer Types with less than 5 cancer deaths expected are not analyzed due to the unreliability of statistical tests based on small numbers.

***The Chi-square statistical test allows us to determine if the difference between what is observed and what is expected is significant.**

If the value is greater than 3.84, then we are 95% confident that the observed number of deaths is significantly different from the expected number of deaths.